storms with that which occurs in other places. Unfortunately, the factor that has been used is not given, but it is probably the old erroneous factor 3. It is in few years that this velocity exceeds 50 miles per hour—37 on the present scale of the Meteorological Office—and there are few stations on the British coast at which this is not often exceeded. One instance of 90 (66 corrected) is given.

It does not seem unlikely that the violence of the tropical hurricanes is somewhat overestimated owing to the contrast with the usual calm of the tropics, and also, perhaps, because the proximity of violent winds from different directions produces a very irregular and dangerous sea.

The memoirs also contain curves showing the direction and magnitude of the daily variation. The results for St. Helena have lately been treated in a similar manner with very interesting results. The daily oscillation of the barometer, more particularly the second term in the harmonic series with the twelve-hour period, must be associated with the transfer of a considerable mass of air from place to place, and it is of interest to try and trace this transfer in the anemometric records from various parts of the globe. These variations, as they are shown at the mouth of the Ganges and in Northern India, are very fully discussed. The conditions are naturally very different at the different stations, both in space and with the changing seasons, and the causes that produce local winds are so complex that it is almost hopeless to try and correlate cause and effect. At all the stations the change from hour to hour seems to be large by day and small by night, from which one may perhaps conclude that local heating by the sun plays an important part in the phenomena.

Although the observations at Mussoorie were only taken during the summer, they are of especial interest, since the station stands on the summit of one of the outer ridges of the Himalayas at an elevation of some 6500 feet above the sea. The hourly and monthly values, as at the other inland stations, are very complex; but there is, as might be expected, a distinct tendency for the air to run up the slope of the mountains during the day and down during the night. Naturally, also, the winds are stronger than at the stations in the plains.

ROCK PAINTINGS OF THE LOWER EBRO.

A VERY interesting article on this subject by MM. l'Abbé Breuil and Juan Cabré appeared in the January–February number of *l'Anthropologie*. The first part of the paper deals with the painted rocks on the Calapatà at Cretas (Teruel) first observed by M. Cabré in 1903, although it was not until 1906 that he communicated his discovery, having then realised its significance in relation to Quaternary art. The pictures, which are painted under a shallow shelter, represent animals in various attitudes, and show considerable vigour of execution. Close by, flint flakes are to be found which exhibit no Neolithic characters, but rather Magdalenian. The paintings comprise three deer, a bull, and a small subject difficult to determine. All are done in dark red, and are outlined by a very lightly engraved line; certain details, such as eyes and nostrils, are added in the same way, as they would not otherwise appear in a monochrome without shading. The first deer, measuring 30 cm. by 25 cm., is represented in a graceful attitude in the act of rising to its feet; the second (33 cm. by 27 cm.) is walking rapidly towards the first, the movement being admirably depicted. It is interesting to note that in all the stags drawn in profile the antlers are conventional, as if seen partly from the front, partly from the side. This curious disposition of the branching is met with, not only at Cretas, but also at Cogul (Lerida), and in France in the reindeer drawings of the Portel grotto. This points to a closer connection in late Quaternary times of the tribes of Aragon and Catalonia with those of the Ariege than with any others.

The second part of the article describes a series of rock paintings at Cogul, in Lerida (Catalonia), which was brought to the public notice in 1907. The surface painted measures about 2 m. across, and lies beneath a ledge of rock. Altogether there are five distinct pictures. Two are hunting scenes, of which the figures are drawn schematically. M. C. Rocafort regards this as a hieroglyphic inscription, possibly of the Iberian period, but the authors consider that it cannot be thus separated as regards date from the accompanying paintings. The third picture (measuring 75 cm. across) represents a stag surrounded by hinds. The animals of this group are less realistic than those of Cretas, but none the less the execution is delicate, and the attitudes graceful and lifelike.

The right-hand lower scene apparently represents nine women dancing round a man, four being to the right of the man, and five to the left. The man is much smaller than the women, and has no clothing beyond an ornament at the knees; the women are all wearing petticoats reaching to the knees, while the upper part of the body is bare. The figures are painted in black, red, or black and red; the man is dark brown rather than black. The outlines of the four right-hand figures are emphasised by engraving. The whole group measures 68 cm. across.

The dress of the women presents a superficial analogy with the Cretan series, but the lifelike character of the Minoan figures and many details are in strong contrast with the stiffness of the Cogul "ladies." Much more definite evidence would be necessary in order to establish any connection between the two series.

The style of the animal frescoes at Cogul, as of those of the Calapatà (Cretas), is that of our Quaternary drawings, not of later art. This indication is corroborated by the presence, not far from the painted rock at Cogul, of small Magdalenian stations with numerous flint flakes (in some cases retouched) of the type usual in France. Thus it is certain that in the immediate neighbourhood of the painted rocks there existed stations of the late Palæolithic age, contemporary with our civilisation of the Reindeer age; it is also highly probable that the whole of these open-air frescoes are to be attributed to the peoples living there; those of single animals afford further beautiful specimens of Quaternary art in animal-drawing. The hunting pictures at Cogul introduce a historic scenic episode as yet unknown in mural art. The dancing scene described raises a small corner of the veil drawn over the social life of those remote ages, and the style of dress tells us something of the use to which the Magdalenian seamstresses put those fine eye-needles which the caves of the Cantabrian Mountains, the Pyrenees, and Dordogne have so long yielded to the astonished eyes of investigators.

PROF. HUGH BLACKBURN.

THE unexpected decease of Prof. Hugh Blackburn, who occupied the chair of mathematics in the University of Glasgow from 1849 to 1879, was announced by Principal Sir Donald MacAlister to the great audience of students and friends assembled to hear the inaugural address of Prof. Gibson. The news came as a great shock to such former students as were present, among them his then retiring

successor, Prof. Jack, and Prof. Gibson himself, and Prof. Blackburn's old student, colleague and life-long friend, Prof. Ferguson. It was well known that Prof. Blackburn's health had broken down seriously in the spring, and that there had been no sensible improvement, but the actual news was unexpected.

Prof. Blackburn's family have been connected with Glasgow for at least three centuries. An ancestor of his, Peter Blackburn, was one of the "regents" of the slowly growing University, from 1574. He was appointed when the Town Council handed over to the University grants made to themselves of lands and buildings by Queen Mary in 1567. From that time until Peter Blackburn was appointed a regent in 1874 the University had been all but moribund. Blackburn was brought from St. Andrews, where he had graduated, and he acted as regent shortly before the arrival of the great reformer Andrew Melville. During Melville's epoch-making six years as principal, and for two years after it, Mr. Blackburn acted as third or principal "regent." The regents used each to take the students committed to them through all their subjects, and for their whole university course. Melville revolutionised this system, setting each regent to teach some special branch of the graduation course to all the students. Mr. Blackburn was, in fact, "professor" of physics and astronomy in the modern sense until he left for Aberdeen, two years after Melville had left for St. Andrews.

It is curious to find the name Peter surviving after three centuries in the family of which Prof. Blackburn was a member. His eldest brother was Peter Blackburn, long M.P. for Stirlingshire and chairman of the Edinburgh and Glasgow Railway before it was merged into the North British. His second brother, Colin Blackburn, afterwards the famous Lord Blackburn of the High Court of Appeal, was eighth wrangler in 1835, and Hugh Blackburn, the youngest brother, was fifth wrangler in 1845. It was a memorable year at Cambridge. William Thomson, afterwards Lord Kelvin, then a boy of eight, came across from Belfast to Glasgow, where, in 1832, his father had been appointed professor of mathematics. At the age of twenty-one he was second wrangler and first Smith's prizeman, and founder and editor of the famous *Cambridge and Dublin Mathematical Journal*. To its first volume Prof. Blackburn contributed a paper on the variation of elements in the planetary system. Nothing quite like that first volume had previously appeared in the British mathematical world. Side by side with Prof. Blackburn's paper were one by Cayley (senior wrangler in 1842); a note on induced magnetism on a plate, by William Thomson; a paper by Sir William Rowan Hamilton, Irish Astronomer Royal; and another on quadrature of surfaces of the second order, by Mr. John H. Jellett, fellow and tutor, and afterwards provost, of Trinity College, Dublin. In the same volume there were papers by Leslie Ellis, senior wrangler in 1840; by Boole, afterwards the famous professor at Cork; by Augustus de Morgan, London; by Stokes, senior wrangler in 1841; by D. F. Gregory, fifth wrangler in 1837; by Townsend, of Dublin, and Liouville, of Paris, with four other papers by the young editor himself. In that splendid galaxy of men of mathematical genius Prof. Blackburn took a distinguished place, and he had deeply impressed his friends, and Thomson, no doubt, in particular, by inventing and exhibiting in his rooms his well-known pendulum with double suspension. A little later the two young Scotchmen, Thomson and Blackburn, went to Paris together on a mathematical and physical pilgrimage, and all their lives they remained attached and devoted friends. In 1871 they published together the full text of Newton's "Principia." Later, Prof. Blackburn published a revised and extended edition of Sir George Airy's treatise on trigonometry from the "Encyclopædia Metropolitana," which appeared in a separate cabinet form in 1855.

William Thomson entered in 1846 on his splendid tenure of the chair in natural philosophy in Glasgow, which he filled for fifty-three years. Two years later his father, the professor of mathematics there, died unexpectedly, and it was probably largely due to Thomson's entire conviction of the exceptional mathematical ability of his friend that Prof. Blackburn was appointed in 1849 to succeed Prof. James Thomson.

His students always felt for him the greatest affection and respect. Every teacher's qualities are appraised by the world very much as Mr. Lowe used to judge primary teachers under the famous revised code—by results. Prof. Blackburn had many distinguished pupils who took high places in the mathematical world. I may name Dr. Thomas Muir, who was an admirable assistant to the professor, and who has never, in spite of his engrossing duties as director of education in Cape Colony, intermitted his work on determinants. There was Sir Charles Abercrombie Smith, formerly Auditor-General in Cape Colony and now Vice-Chancellor of the Cape University; Mr. Dickson and Mr. Dodds, formerly tutors of Peterhouse; Prof. Pinkerton, of Cardiff, and Mr. Nixon, of Balfast. But Prof. Blackburn was much more than a mere mathematician. His university speedily discovered his administrative and financial strength, and made him successively convener of its library and its finance committees. Mr. Blackburn was, perhaps, more trusted and more responsible than any of his colleagues in the removal of the old college from the site it had occupied for four centuries, after it had become unsuitable and perhaps insanitary, to the present splendid buildings. Among his colleagues his authority was always great, and he owed this to the strength and simplicity of his character, and to the clearness of his practical and judicial mind. Students and colleagues alike, who knew him better than others could, honoured him and believed in him. Of a sensitive and artistic nature, he did not, however, care, after thirty years, to continue services which increasing deafness made irksome and difficult.

For years, Prof. Blackburn, in declining strength and health, never left the estate, beyond the Mull of Ardnamurchan, where he had found a home in 1879, and where he died. W. J.

NOTES.

SIR RAY LANKESTER writes to inform us that he has heard from the representatives of the late Prof. Anton Dohrn to the effect that the Zoological Station at Naples remains the property of the heirs of its founder. Neither the German Government nor any German society have acquired any rights in its future disposition. Dr. Reinhardt Dohrn, who has for two years been the acting director of the Zoological Station of Naples, is now director, and has inherited from his father (by agreement with his brothers) the actual property and the leases granted by the Naples municipality as to the site. We wish Dr. Reinhardt Dohrn success and happiness in carrying on the work of his eminent father.

THE Meteorological Office has received reports of observations of an aurora on the nights of October 17, 18, and 19, at several places in England, Scotland, and Ireland. An aurora is also reported in the French *Bulletin International* as having occurred at Haparanda on the night